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ENTOMOLOGICAL NEWS

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Studies of Semidesert Ants (Hymenoptera: Formicidae).

By A. C. COLE, JR., Twin Falls, Idaho.

(Continued from page 101)

Environmental Factors Governing the Sand Dune. The sand dune presents many interesting and diverse problems to the investigator. Its close resemblance to the desert with similar conditions of temperature, moisture and soil, provides a well-marked region for study within the bounds of practicability. As in the true desert, environmental conditions of the sand dune are continually fluctuating.

Perhaps the most outstanding features of a dune habitat which guide the distribution and number of ants are prevailing temperatures. Important among these are soil surface and substratal temperatures, for all dune-dwelling ants are soil inhabitants. The general lack of dense vegetation on the dune, which, if present, would provide shade, and the nature of the soil itself tend toward high diurnal soil surface and substratal temperatures. At night, though cooling of the sand is relatively rapid, the accumulated heat below the surface is partially retained. High daily atmospheric temperatures and unimpeded sunlight are, for the most part, responsible for the high temperatures of the soil.

Moisture, in its many phases, is of great importance to the physical and biotic make-up of the dune habitat. Precipitation, especially during the summer, is slight. The sand acts as a sponge and absorbs rain as rapidly as it falls. Thus the relative humidity of the atmosphere is almost invariably low, while the rate of evaporation, due among other things to the continuous action of the wind, is very high. The combination of these various components of moisture produces xeric conditions.

Great variation in the action of strong winds is, aside from

the nature of the soil, one of the most obvious of the set of factors governing the sand dune. Over much of the area the sand is continually in motion, and the dune gradually moves. Thus the instability of the dune is of great importance. Where the sand is continually in motion, vegetation and ant colonies as well are absent. They are unable to contend with such hostile environment. Only in "blowouts" or valleys is there protection from wind, and, in such a habitat, flora and fauna are present in their greatest numbers.

The soil in much of the dune area is composed of pure sand. In places where "blowouts" have occurred and where vegetation has become established, a small amount of humus is intermingled with the sand, increasing in proportion with the disintegration of plants. The instability of the dune inhibits the development of the soil and most of it remains in a more or less sterile condition.

3. The Winter Mortality of Pogonomyrmex occidentalis.

The ant, *Pogonomyrmex occidentalis* Cresson, passes the winter in chambers deep below the surface of its mound. The depth seems to vary with snow cover, soil moisture, and the like, but the bulk of the ants probably do not descend lower than three feet from the apex of the mound. Seeds are stored in the lower chambers during the autumn and, without any doubt, feeding occurs during the winter or "hibernating" season. The mounds may be entirely or partially leveled during the winter by the action of wind and rain and often the site of

TABLE 2.

The Winter Mortality of *Pogonomyrmex occidentalis* in the Twin Falls Area, Idaho.

Mound Number	Total Mortality
1	33
2	26
3	41
4	40
5	38
6	22
7	15
8	4
9	18
10	36

the colony is marked by only a few scattered pebbles. The ants are practically inactive during the entire winter and no mound reconstruction takes place.

During early spring the ants transport to the surfaces of the mounds their kind which have died during the winter. During 1932 the transportation occurred on the twenty-second of March and continued for only two days. Apparently all dead ants were brought to the surface, for minute examinations of mounds disclosed no additional ones. Table 2 shows total winter mortality for a series of ten mounds in the vicinity of Twin Falls, Idaho. Mounds selected for examination were those protected from wind so that conditions tending to disturb the dead ants were reduced to a minimum. It should be noted that these data present only an indication of mortality in various parts of the region occupied by *P. occidentalis* but they do seem to be indicative of conditions in the Twin Falls area.

TABLE 3.

Winged Ants Collected from a Wind-vane Insect Trap Near Hollister, Idaho.

Date	Species of Ants*	No. Ants (20 ft. Trap)	No. Ants (30 ft. Trap)	Weather
7/ 5/32	P. occidentalis	41	22	Windy
7/ 8/32	" "	103	17	"
7/11/32	" "	432	296	"
7/15/32	" "	1,974	871	"
7/19/32	" "	5,455	1,200	"
7/22/32	" "	1,325	472	Still
7/29/32	" "	213	87	"
8/ 5/32	" "	4	2	"
8/12/32	" "	1	0	Windy
8/19/32	" "	0	0	"
8/26/32	" "	0	0	"
10/13/32	L. rugatulus	3	2	"
10/14/32	" "	7	4	"
10/20/32	" "	5	1	"
10/21/32	" "	1	0	"
10/27/32	" "	0	0	"
10/28/32	" "	0	0	"

* All winged females.

4. The Effect of Wind on the Dissemination of Semi-desert Ants.

Although ants are well able to fly to considerable heights, prevailing winds are influential in determining the height and distance covered.

The contents of two wind-vane insect traps,* mounted upon a pole at twenty and thirty-foot heights, near Hollister, Idaho, were watched constantly for winged ants throughout the spring, summer, and autumn of 1932. Table 3 gives the number of each species found. Only two species, *Pogonomyrmex occidentalis* Cresson, and *Leptothorax curvispinosus rugatulus* Emery (all winged females), occurred in large enough numbers to be significant.

It is an interesting fact that the last ant species to develop winged forms in the vicinity of Twin Falls is *L. rugatulus*, one of the two species listed in the table. When the brood-rearing of *P. occidentalis* has ceased that of *L. rugatulus* is progressing rapidly, the last date in which brood appeared in the nest during 1932 being November 6.

It has been observed by the writer that new colonies of *P. occidentalis* are most abundant in areas east and southeast of the center of the original concentration. Apparently this is due to the transporting action of the prevailing westerly and northwesterly winds of southern Idaho. So marked is this action that the writer has been able to observe rough zones extending outward from the centers of original concentration, the number of colonies roughly being inversely proportional to the distance from these centers.

Description of a New Species of Eurytoma (Hymenoptera: Chalcidoidea).

By A. B. GAHAN, U. S. Dept. Agr., Bureau of Entomology, Washington, D. C.

Two species of *Eurytoma* have been reared from galls of *Eurosta solidaginis* (Fitch) by Miss Gwladys F. Hughes, a graduate student at Cornell University. One of these species proves to be *Eurytoma gigantea* Ashmead, long known to in-

* Fulton, R. A., and Chamberlin, J. C. A new automatic insect trap for the study of insect dispersion and flight associations. Jour. Econ. Ent. XXIV, (1931), 757-761.

fest the galls of *Eurosta*. The other species is apparently new and is described herewith in order to make the name available for use by Miss Hughes in an account of her observations on its development.

Eurytoma obtusiventris, new species.

This species is distinguishable from most of the Nearctic species by the more robust, less protracted, and less strongly compressed abdomen. The abdomen is similar to that of *obtusiloba* Ashmead but in that species the scape, legs, and ovipositor are testaceous while in the new species they are black. Less obvious but apparently dependable characters in which the new species seemingly differs from most if not all of the other species are to be found on the front coxae and the occiput. In all of the species of *Eurytoma* the front coxae are more or less impressed on the ventral side to receive the lower margin of the head, this depression in some instances being carinately margined, but more commonly with the edges rounded and without a carina. In the present species the front coxae are broadly flattened ventrally, the flattened area limited apically by a weak and slightly oblique transverse carina which is elevated at outer margin of coxa to form a distinct but short rounded tooth-like projection. Likewise on the posterior surface of the head of many and probably all of the species of *Eurytoma* there is present a distinct groove extending from the dorsal margin of the occipital foramen downward toward the base of the mandible and dividing the postgena (in the sense of Snodgrass) into an inner and an outer plate. In most of the species (*e.g., gigantea* Ashmead) this groove is deep, with its inner edge forming a strong carina or fold which is most prominent near its lower extremity just before it reaches the carina separating postgena from gena. In the present species this fold is distinct above but gradually becomes weaker and fades out entirely before reaching the carina separating gena and postgena.

♀.—Length 3.5 mm. Head nearly three times as broad as thick antero-posteriorly at the middle, with the umbilicate punctures unusually coarse, the interstices narrow but with very fine reticulate sculpture, the umbilicate punctures at the bottom smooth and shining; clypeus and a broad median line on face without umbilicate punctures, nearly smooth but with weak reticulation; gena also with a moderately broad area running from the eye margin to the base of mandible without umbili-

cate punctures but densely finely punctate and dull; ocellocular line very little longer than diameter of ocellus. Antenna not distinctly clavate; first funicle joint about one and one half times as long as broad; second a little longer than broad; third to fifth funicle joints subequal and nearly or quite as long as broad; club 3-jointed, not broader than the funicle and a little shorter than the preceding three joints combined.

Prothorax, mesoscutum, and scutellum sculptured like the head; propodeum broadly hollowed out, irregularly transversely striated medially, coarsely rugoso-punctate laterally both within and outside the concavity. Hind coxae finely punctate and dull; hind tibia clothed with silky hairs. Marginal vein usually a little longer than postmarginal, stigmal and postmarginal nearly equal.

Abdomen about as long as thorax, not strongly compressed, very shortly petiolate, the second and third tergites subequal, fourth a little shorter than second and third combined; fifth very short, sixth longer than fifth but nearly perpendicular, seventh very short; first to fourth tergites smooth and polished dorsally, faintly reticulated laterally, entirely bare; sixth tergite distinctly hairy; apices of ovipositor sheaths very slightly exserted.

Knees, very narrow apices of all tibiae, and tarsi except the apical joint, reddish testaceous; wings hyaline; rest of insect deep black.

Type-locality.—Ithaca, NEW YORK. *Type.*—Cat. No. 49893, U. S. N. M.

Described from 58 female specimens as follows: The *holotype* and 43 *paratypes* from Ithaca, N. Y., reared by Miss Gwladys F. Hughes from *Eurosta solidaginis,* in 1930; 3 females from the same host and locality reared May 12, 1927, by Mrs. V. T. Phillips; 3 females reared at Chicopee, MASSACHUSETTS, from "Trypeta galls on Solidago" (probably those of *E. solidaginis*) by F. Knab; 5 females reared from *Eurosta solidaginis* at Tallulah, LOUISIANA, in April, 1910, and bearing Hunter No. 1932; 1 female from galls on goldenrod taken at St. Catherine, ONTARIO, in July, 1907; 1 female from gall on *Solidago* collected in Riley Co., KANSAS, by Marlatt in September, 1888; and 1 female from the collection of Asa Fitch, also from some insect on *Solidago,* the locality not given.

Two Chalcid Parasites of the Goldenrod Gall-fly, Eurosta solidaginis (Hymenoptera: Chalcidoidea; Diptera: Trypetidae, et al.).

By Gwladys F. Hughes.

The purpose of this investigation has been to learn something more about the parasites of *Eurosta solidaginis*. In 1915 Dr. C. Ping [1] made a study of the tenants of galls found on Canada goldenrod; he worked out the life histories of the gall maker *Eurosta solidaginis* and the associated Mordellid beetle *Mordellistena unicolor*. He thought it probable that a certain chalcid, *Eurytoma gigantea*, also present in the gall, is parasitic on *Eurosta*. Others also have believed the chalcid to be a parasite, but a question has been raised as to whether this *Eurytoma* is not itself a gall maker, since it appears to be found in somewhat smaller galls.[2] Rev. Thomas W. Fyles [3] mentions the fact that he raised two kinds of parasites from the galls, one of which was *Eurytoma gigantea*.

The Goldenrod Plant and the Gall Maker.

The Canadian goldenrod, *Solidago canadensis*, grows most abundantly upon flood plains or in wet meadows. The gall, as is well known, is formed as a swelling of the stem tissues caused by the fly *Eurosta solidaginis*. Measurements were made of 100 galls taken December 14. Length ranged from 20 to 40 mm., width varied from 20 to 30 mm.; average length was 28 mm., average width 25 mm.

In the spring *Eurosta solidaginis* lays its eggs upon the plants. The larvae hatch, establish themselves in small cavities within the pith, and attain their full size during the growing season. Prior to pupation, while the larvae have mouth hooks to do the work, they make burrows extending from the central cavity of the gall to the outside. In general, the epidermal layer is left, and the adult insects must make their way through it.

[1] Ping, Chi. 1915. Some Inhabitants of the Round Gall of the Goldenrod. Pomona Journal of Entomology and Zoology, 7: 161-177.

[2] Johannsen, O. A. 1910. Notes for 1910. Maine Agricultural Experiment Station, Bulletin 187: 9.

[3] Fyles, Rev. Thomas W. 1894. *Trypeta solidaginis* Fitch and Its Parasites. Canadian Entomologist 26: 120-122.

Pupation begins in November (indoors) and continues sometimes until late in June, according to temperature. Out of doors the Eurostas normally do not pupate before March, and they do not emerge as adults until late May or June. After June 18 no more puparia have been found.

To hasten the development of Eurosta larvae, galls collected were brought into the laboratory and kept in boxes at room temperature. Adults were reared and fed upon sugar solutions. Often when galls were opened for examination, flies were found to have escaped from their puparia and begun to break through the epidermal wall of the galls. Upon release from the burrow, they ceased their efforts and came out by the easier way. In no case observed did development progress normally thereafter; the fly failed to become a normal adult and did not live long.

The Population of the Galls.

The galls were found to be infested with the gall maker *Eurosta solidaginis* and with the larva of a stem-boring Mordellid beetle, *Mordellistena unicolor,* previously studied by Ping; with the two species of *Eurytoma,—Eurytoma gigantea* and *Eurytoma obtusiventris* that are the subject of this paper; and with a number of other lesser parasites and scatterings to be mentioned later. Of the four usual inhabitants counted, there were: 834 *Eurosta solidaginis,* 352 *Eurytoma gigantea,* 1045 *Eurytoma obtusiventris* and 245 *Mordellistena unicolor.*

Besides Eurostas, Eurytomas and Mordellids, the galls were occupied by Hymenoptera belonging to the family Braconidae. These began to appear in numbers during May. Several adults were found inside the galls before they had emerged, occupying burrows just outside the central cavity. They were determined by Mr. A. B. Gahan of the United States Museum as belonging to subfamily Sigalphinae, genus *Schizoprymnus.* They may, he said, be parasitic upon the Mordellid beetle in the gall, but certainly not upon the gall maker.

On June 4 and again on June 6, small beetles were observed among the galls collected a week before. These were determined by Dr. P. P. Babiy, of Cornell University, to be *Iso-*

hydnocera curtipennis Newman of the family Cleridae. Leng and Davis in "Insects of New York" state [4] that another species in this genus is "predatory on Mordellid larvae in stems of annual plants."

On June 16 a large shriveled pupa case in a small gall made by *Eurosta* was identified by Dr. W. T. M. Forbes, of Cornell. as that of a Lepidopteran of the family Pyralididae, subfamily Pyraustinae. The moth had emerged; an exit hole plugged with silk was found near the bottom of the gall.

A gall opened July 16 contained a number of tenants. One of these, having a white silk cocoon, Mr. Cushing, of the United States Museum, determined as an Ichneumonid, *Lissonata marginata* Provancher. Six Lepidopterous larvae found dead within a gall were identified by Mr. Heinrich, of the same Museum, as *Trichotaph levisella* of the family Gelechiideae; he said that these are probably inquilines.

GALL DIMENSIONS IN RELATION TO GALL INHABITANTS.

Since it had been suggested by Dr. Johannsen that Eurytomas occupy galls smaller than those in which Eurostas are found, an examination was made of gall dimensions in relation to gall inhabitants. Three sizes were arbitrarily selected as "large," "medium" and "small," and 490 galls were arranged in three groups according as they approximated these measurements: Large—30 mm. x 25 mm., Medium—25 mm. x 20 mm., Small—20 mm. x 15 mm.

	Large	*Medium*	*Small*
Eurosta	47	107	47
Eurytoma gigantea	0	3	6
Eurytoma obtusiventris	48	167	65

Judging from these figures, and from observations made throughout the work for this paper, I should say that in general the size of the gall does not clearly indicate the nature of its inhabitants.

EURYTOMA GIGANTEA AND EURYTOMA OBTUSIVENTRIS.

Dr. Ping found two species of chalcids in Eurosta galls.

[4] Cornell Agricultural Experiment Station Memoir 101.

One was the well known *Eurytoma gigantea*, the other an unnamed species *Eurytoma obtusiventris*, described in an accompanying paper by Mr. A. B. Gahan. In my collections the latter species outnumbered the former three to one.

Larvae of both species were found in galls in early September. Their pupae develop more slowly than the pupae of Eurostas, and the emergence of the adults takes place from one to two weeks after the emergence of the first Eurostas. They will live for at least two weeks, and will feed upon sugar solutions.

The larva of *Eurytoma gigantea* is larger than that of *Eurytoma obtusiventris*, and different in appearance. The former species disposes of the *Eurosta* larva before *Eurosta* has pupated, and is found naked within the central cavity of galls early in September. On the other hand, *Eurytoma obtusiventris* pupates in the last larval skin of Eurosta, in the puparium of the fly itself. Galls examined in September showed many *Eurosta* larvae with the larvae of *Eurytoma obtusiventris* within their bodies.

The presence of *the parasitic larva stimulates Eurosta to a much earlier pupation.* Out of doors in the latitude of Ithaca, New York, *Eurosta* is not known to pupate normally before March; under the stimulus of the parasite it forms its puparium in September.

I have found that *Eurytoma obtusiventris* transforms to the adult stage during May, but that *Eurytoma gigantea* is later, not becoming adult until the end of May, and emerging during June and July.

Terminology of Types.

By Ezra T. Cresson, Jr.

In "The American Midland Naturalist" there appeared a very interesting and commendable paper by Donald Leslie Frizzell, entitled "Terminology of Types".[1] Therein is listed 233 different nomenclatural type-terms and words compounded

[1] Published by the University of Notre Dame, Vol. 14, pp. 637 to 668 (1933).

with "type" (insofar as they are employed in biology) which have been proposed for the various kinds of types of genera, species, etc., and illustrates the chaotic condition existing in this field. The list is prefaced by an introduction wherein the author states the purpose of the paper, nature of a nomenclatural type, choice of type-terms, recommendations, acknowledgments and a selected bibliography. Various symbols and different type-faces have been employed to indicate the status of the various terms; those recommended by the author are printed in bold-face type. These are: genotype, holotype, homoeotype, hypotype, lectotype, neotype, paratype, plastotype and syntype. In selecting these, which the author considers sufficient, he adopts the principle of priority except where it conflicts radically with usage, stating that "a limited number of terms is desirable if the goals of uniformity, of usage and ease of comprehension are to be attained," but realizes that "certain groups of organisms will require types and corresponding terms which would be absurd in other groups." He further states that he has consulted several well known taxonomists and biologists and the published literature on this subject.

In reviewing this paper and referring to the protologs of some of the terms, I find that the author does not seem to be fully acquainted with his literature, in that his definitions of some of the terms are not those of the protologists. In the matter of selecting the term to use, the law of priority should be followed as long as the term is in active use, whether or not it is correctly formed. Discarded, subsequently discovered, synonymous terms and amended constructions should not be considered if we are to attain stability.

As many students and some well known taxonomists apparently do not know the correct meaning of the type-terms they use, or if so, prefer to supply their own definitions, which may be quite different from the original meaning and intent, it seems that more attention should be given to this important subject. With this in mind I am taking the present opportunity to list those terms most in use by entomologists. In the entomological

department of the Academy of Natural Sciences of Philadelphia, only the following terms are recognized, and are considered sufficient to indicate all the necessary "types": type (holotype or lectotype), cotype (rarely), paratype, allotype, topotype, homotype and genotype. These terms are used as follows:

Type.—This term is applied to the specimen upon which a species is based. Dr. Oldfield Thomas,[2] in his suggestions for the more definite use of the word, says that the name "itself when first introduced was meant to refer to the particular specimen originally described, but it soon was naturally applied to any individual of the original series . . . ", but was later "applied to any individual from the collection of the original author obtained no matter how much later, and often not even determined by him as belonging to his species." At present, however, there is no doubt as to what is meant by "type."

A specimen selected and designated by the protologist as the type of his species and published as such when describing his species, becomes a HOLOTYPE. This term was proposed by Schuchert [3] for "a particular individual deliberately selected by the author of a species." We may infer here that the selection must be made at the time the species is first described for he further qualifies by stating that "the author of a new species having failed to select a holotype, no subsequent author can do this for him."

A specimen subsequently selected from a cotypic series, designated and published as the type, either by the protologist of any other person, becomes a LECTOTYPE. This term was also proposed by Schuchert [4] for a cotype "chosen subsequently to the original description to take the place which in other cases a holotype occupies." This definition is sufficient to need no comment except that such selection of the lectotype, to be valid, must be published. The mere labeling as "type" a specimen of a cotypic series does not validate such selection. Many taxonomists use the word holotype in the sense of lectotype. The

[2] Proc. Zool. Soc. London, 1893, p. 241-242.
[3] Science, (n. s.), V, p. 637 (1897).
[4] Ann. Mag. Nat. Hist., (7), XVI, P. 103 (1905).

two are not synonymous although either is applied to the type of the species.

Cotype.—This term as proposed by Thomas in 1893, applies to "one of two or more specimens together forming the basis of a species, no 'type' having been selected." The word "syntype" was later proposed to replace the poorly constructed word "cotype," and is an unnecessary synonym. When a type (lectotype) is properly selected from a cotypic series, the remainder of the series automatically become paratypes. Some taxonomists use cotype incorrectly for paratype.

Paratype.—This term is used for a specimen, other than the holotype or lectotype, of the series upon which the protologist based his species. The selection of the lectotype automatically makes the remainder of a cotypic series, paratypes. The word cotype should not be used for a paratype.

Allotype.—This term should be used with caution. It was proposed by Muttkowsky [5] (not by Banks and Caudell as stated by Frizzell), for the sex not designated by the holotype. "It need not be described by the protologist; it can be contained in the original as well as in any subsequent description by other authors," and "the first of the opposite sex subsequently described is to be called the allotype." Here we note, that it is the first description of the opposite sex that established the allotype, whether or not it is so designated. This fact brings into the field an element conducive of instability, as there is always the possibility of a previous description of the opposite sex being discovered. If we consider the term to apply to the specimen of the opposite sex first described as the allotype, we again conduce to instability in that the student may have misidentified his material. One can readily see in this case that several allotypes may possibly be described and so designated, of which one or none may be valid. It is a much abused term, which I personally do not use in print, merely including such specimen as one of the paratypes, if the original series contained both sexes.

Topotype.—This term is applied to any specimen conspecific with the type collected at the exact locality where the type was obtained. A topotype is of importance when the type of the

[5] Bull. Milwaukee Oub. Mus., I, p. 10 (1910).

species is lost or has been destroyed. In some respects it is of more value than a paratype.

Homotype.—This term was proposed by Walsingham and Durant [6] for "a specimen named by another than the author, after comparison with the Type." This is the first use of the term in a nomenclatural sense, and as originally constructed and as it is in general use, the emended "homoeotype" is unnecessary. Homotype is a term of doubtful value. If used in its original meaning, "like the type," such specimen should be not only conspecific with the type, but of the same sex, and possessing the same structural and color features as the type. A specimen compared with the type and considered conspecific with the type, but not necessarily a replica of the type, should be labeled merely "Comp. w. Type" (Compared with type). This specific use of the term homotype gives a greater value to the specimen. Of course the qualifications and the carefulness of the comparer is an important factor in this matter, consequently his or her name and the date (year) the comparison was made should always be given on the label.

Genotype.—This term is now applied to a species upon which a genus is based. It was originally proposed to apply to a specimen of the type-species of a genus, but was practically never used in that sense.

In designating or citing genotypes, certain information is essential in order to avoid ambiguity. The original generic name of the genotype, the name of its author and the date of its proposition, should be given, and as well, the new combination if such is created. For example:

Genotype: *Lucilia caesar* as *Musca caesar* Linn., 1758. (By designation of Macquart, 1833.)

The manner in which the genotype is created or selected, may be expressed by a few explanatory words instead of by the use of a specific term, as: "by original designation" instead of orthotype; by "monotypy" instead of haplotype; "by subsequent designation" or "by designation of . . . " instead of logotype; "by tautunomy" instead of tautotype.

[6] Rules for Regulating Nomenclature. "Merton Rules." London, 1896, p. 13.

An Answer to E. Graywood Smyth on "Synopsis of Cicindelidae" (Coleoptera).

By Alan S. Nicolay, Montclair, New Jersey.

In Entomological News, Vol. XLIV, No. 8, October, 1933, pp. 197-204, Mr. Smyth saw fit to criticise the above paper.* According to this article everything appeared wrong and nothing right. The authors had blundered badly.

Now to be helpful, criticism should be constructive. Errors, incorrect citations and carelessness are bad enough in an original paper, but when included in the criticism of the work of another they are not only inexcusable but appear deliberately intended. The only justification I can find for Mr. Smyth's tirade is that being several thousand miles away from collections and literature he apparently thought that the final curtain had been run down on Cicindelidae in 1907 and that there was nothing additional to be added to the subject.

I have examined all the types and specimens in the LeConte collection in Cambridge, the Horn collection in Philadelphia, the Casey collection in Washington has been gone over thoroughly many times, also the collections in the American Museum of Natural History, the Brooklyn Museum, and many private collections, combined with innumerable specimens loaned by my correspondents, especially from California. From the remarks and conclusions drawn it is evident that Mr. Smyth never looked in a "Casey Box." Before sending this paper (which is the type I dislike exceedingly to take my limited time to write) to press, I have again rechecked the Casey species mentioned here.

I shall now take up Mr. Smyth's remarks in detail.

Mr. Smyth writes, "Few of their contemporaries, we fear, can agree with them in the view that the arrangement of a complex group can be simplified by using another's carefully worked out list, and from it elevating his subspecies to the specific rank and considering his varieties and phases as varietes." I quote from our paper, "We feel that the best results are obtainable by recognizing only species and varieties." Having adopted

* Jour. N. Y. Ent. Soc. Vol. xl, No. 3, Sept. 1932.

this policy, which is that of Mr. Charles Leng, not only in his check list used by all coleopterists but also in his "Revision of the Cicindelidae" (Trans. Am. Ent. Soc. XXVIII, March, 1902), the last complete monograph on the entire family, in what other way could we handle the subject than by placing each name either as a *bona fide* species, variety or synonym, on its own merits?

Mr. Smyth "wonders why we passed over the crepuscular genera and began with the most difficult group in the genus *Cicindela*, that of *purpurea*." I again quote from our paper, "It would, undoubtedly be preferable to publish one large paper on the entire family. However, the spare time of both authors is very limited, and we deemed it more desirable to publish our findings in the various groups in serial form rather than postpone the entire paper to a far distant date." I cannot figure Mr. Smyth's reasoning that the *Cicindela purpurea* group is more difficult than Megacephalini including *Omus*. To my mind *Omus* is now so split up and confused that no one, with the exception of Dr. Walther Horn, is in a position to say with any certainty what names should be applied to many specimens. I have looked often with bewilderment into the two cabinet drawers of *Omus* containing Colonel Casey's collection at the National Museum and for this very reason, and until I had sufficient time to study this most difficult genus, decided to take up *Cicindela* first.

As mentioned in our paper, our "Synopsis" is intended only as a forerunner of a monographic revision, which will be complete and arranged according to the accepted present classification of the entire family.

Our paper is almost entirely a task of collecting and consolidating the views and conclusions of our predecessors. There is very little that we have changed, but of course we reserve the right to use that which we consider correct while mentioning briefly our reasons for rejecting other conclusions.

Mr. Smyth feels that our key "based almost wholly upon color and maculation" is not adequate. I am inclined to agree with him, speaking in general, but when one deals with such

distinctly marked forms and takes up only one small group (all considered as one stem species by some authorities) of such and enormous and world-wide genus as *Cicindela*, I challenge him to offer a key on structure. It cannot be done! When we write our key on all the North American species we will certainly avoid color and maculation as much as possible.

Mr. Smyth writes "those acquainted with the *purpurea* group have decided years ago that *cimarrona* is not entitled to specific rank" and then quotes Doctor LeConte to this effect. Where has Mr. Smyth been all these years and why does he make so erroneous a statement? *Cimarrona* is considered a valid species by Mr. Charles Leng, not only in his check list (1920) but also in his revision (1902). In this latter paper Mr. Leng writes, "I separate this species because the type of the elytral markings is radically different and, notwithstanding the variations in color, is constantly preserved, thereby suggesting a form too well established to be called a variety." *Cimarrona* is regarded as a subspecies by Dr. Walther Horn (1930) in which class he also puts *decemnotata*, which Mr. Smyth writes, "is admittedly entitled to specific standing!" Finally among the many specimens and collections seen, I have yet to note an example that could not be readily and easily placed as *cimarrona*.

For Mr. Smyth's information, Casey's *auguralis* is identical in every way with *limbalis* (not *purpurea*) except for the slight differences mentioned in our "Synopsis." Casey's misleading statement connecting *auguralis* with *purpurea* instead of *limbalis* was possibly due to the fact that his *limbalis* was known to him and incorrectly labelled in his collection as *amoena*. According to the views of Lantz as mentioned by Smyth, *auguralis* having the middle band less oblique but at right angles to the border of the elytra (exactly as in *limbalis, splendida, denvercnsis*, etc.) could not possibly be a variety of *purpurea* following out Mr. Smyth's line of reasoning. One should when possible examine types before forming too hasty conclusions.

I again looked at the *auguralis* in the Casey collection. The one specimen, marked type, is of a dull bronzed color and has

the middle band touching the sides and of course at right angles to them. The other four specimens are marked paratypes and are of a greenish color. All five are from Colorado. The middle band is long and sinuate but slightly more oblique than in typical *limbalis*. Also the band does not end in the usual oval dot or dash of typical *limbalis*, but is about the same width at both base and apex. These last characters also undoubtedly led Casey to associate it with *purpurea*.

Although we are accused of displaying a rather empirical method of handling the subject, we at least are not guilty of suggesting two new names without not only paragraphing an original and specific description but even designating a type or exact locality other than general range. Mr. Smyth has perpetrated this error on two occasions. I have read Doctor Horn's "Letters of a Traveling Entomologist," and certainly, as he was aware of this so-called species *sedalia*, he would have named it himself in one of his subsequent papers on American tiger beetles if he had thought it worthy of a name. I can see no connection between this form and *cimarrona* with the short branches for lunule, which is so well known by Mr. Charles Leng and others.

After examining specimens from Colorado in the Horn collection in Philadelphia, I can fit them nicely in either *limbalis*, *splendida* or variety *cyanocephala*, and *cimarrona*. I really feel that the name *sedalia* is superfluous and if retained at all would rank only as a variety.

Although Mr. Smyth claims to have shown years ago that *transversa* and *splendida* were one species, because they were taken in copula near St. Louis, Missouri, we would humbly report that we made this same observation here in New Jersey and New York with *limbalis*, and where the more southern species *splendida* is never found nearer than three hundred miles away, around Washington, D. C. Also Mr. Leng originally described *transversa* from Illinois and New Jersey, *limbalis* being indigenous to both states. It is true, he placed it as a variety of *purpurea*, but at that time (1902) the short transverse middle band was not regarded of value in designating

a species or group. Now as mentioned in this paper previously, Lantz after studying the subject regarded it as separating the *purpurea* group from the *limbalis, splendida,* etc., group, and it is apparently one of the few things that Mr. Smyth and I agree on.

Although Mr. Charles Leng in his check-list ranks *splendida* as a good species, Mr. Smyth "finds small reason" for this. Why, may I ask, if such easily separated things as *limbalis,* which is never found in the East as far south as Virginia and North Carolina (except an occasional specimen taken high up in the Blue Ridge Mountains, Virginia, where *splendida* does not occur), and *splendida,* which does not occur north of Virginia (and possibly southern Maryland), are found together in Kansas and even taken there in copulation, should they be regarded as the same species? Has Mr. Smyth never heard of Lepidoptera of closely related, but distinct, species being found in copula with the resulting hybrids? As I pen this article I look at a tank of tropical fish in which are Mexican platies and swordtails. Although not only of distinctly different species but even of different genera these two species commonly cross with resulting offspring having interesting characters of both. Then why not occasionally among Cicindelidæ?

(To be continued)

A New Gall Midge on Fig (Diptera: Itonididae).

By E. P. Felt, Stamford, Connecticut.

The species described below was reared by Mr. Henry Bird, of Rye, New York, in April, 1933, from fruits of a species of fig known as *Ficus populina* (*brevifolia*), growing in the Royal Palm State Park, Florida.

He found that the larva occupies an enlarged seed capsule which elongates inwardly towards the center of the fruit, attaining a length of five times or more than that of the surrounding seed vesicles. The fleshy tissue of the fruit receptacle is not mined nor affected except at maturity. The newly-formed

puparium wriggles part way through the wall of the receptacle, the outside skin being marked with a pit-like scar and in a couple of days the edges of this "pock mark" becomes slightly elevated and blackened and soon the puparium protrudes from the fruit. Mr. Bird states that in the puparium and directly after emergence, the adult abdomen is distinctly reddish, it turning later to the dark smoky hue of the rest of the insect. He found that it was preyed upon to a considerable extent by a Hymenopterous parasite.

This species is easily distinguished from the related *Ficiomyia perarticulata* Felt by the more pronounced brownish color of the body and in particular by the distinct fuscous markings of the wings and the occurrence of only 32 antennal segments or fewer, as compared with the 41 antennal segments of the earlier described species.

Ficiomyia birdi n. sp.

♂. Length 2.5 mm. Antennae nearly as long as the body, rather thickly haired, light brown; 32 segments, the fifth with a stem three-fourths the length of the subcylindrical basal enlargement, the latter with a length one-fourth greater than its diameter, a low circumfilum near the basal third and apically, a whorl of coarse setae basally and a broader whorl of finer, strongly bent setae subapically. Terminal segment produced, with a length three times its diameter and tapering to a narrowly rounded apex. Palp consisting of one, slender, rather long segment.

Mesonotum yellowish brown, the submedian lines thickly haired. Scutellum and postscutellum fuscous yellowish. The abdomen fuscous yellowish, sparsely covered with brown scales, the latter more abundant on the distal segments.

Wings, the basal half of costa thickly clothed with fuscous scales, the distal half a variable pale yellowish, the membrane subhyaline, with a distinct irregular ornamentation of fuscous scales, there being a broad, subquadrate patch on the anterior margin near the distal third and attached thereto a somewhat n-shaped mark reaching to the margin of the fifth vein, the free ends extending toward the tip of the wing. There is also a small irregular fuscous patch near to and just in front of the wing tip and an indistinct broad fuscous crescent extending from the tip of the branch of the fifth vein and arching over

to the fifth. Halteres pale yellowish basally, fuscous apically.

Legs, femora and tibiae dark brown, the tarsi mostly yellowish. Claws simple, strongly curved, the pulvilli rudimentary.

Genitalia, basal clasp segment moderately stout and at the internal angle a long, tapering, curved process, roundly truncate apically, the latter making the short, stout, terminal clasp segment with a large tooth at its internal apical angle, subapical. Dorsal plate broad, deeply and triangularly emarginate, the lobes broad, obliquely truncate and thickly setose apically. Ventral plate short, broad, broadly and roundly emarginate.

♀. Length 2 mm. Antennae probably nearly as long as the body, thickly haired, light brown, presumably 32 segments, the fifth with a short, broad stem one-half the length of the broad basal enlargement, the latter with a length scarcely equal to its width and remarkable because of the thick sub-basal whorl of long stout setae reaching to near the middle of the following segment. Low transverse circumfila occur at the basal third and apically on the enlargement.

Color, wing and leg characters nearly as in the male. Ovipositor moderately stout, about half as long as the abdomen, pale yellowish orange, the terminal lobes narrowly oval, with a length about twice the width, pale.

Types deposited in the U. S. National Museum.

Sex of Migrating Danaus archippus (Lepid.: Danaidae).

In the NEWS for July, 1933, Dr. H. T. Fernald, of Orlando, Florida, asks as to the sexes of migrating *D. archippus*. So far as I have ever been able to ascertain, all such taken at sea and away from this continent have been males. In my "Butterfly Hunters in the Caribbees" (Scribners, 1894) I describe one such migration observed off the Bahamas. Since then I have found them, food for fishes, off Haiti and Jamaica, near Cienfuegos, Cuba, and on the island of Cozumel, off the east coast of Yucatan—all males. This past fall, over the Skokie Marshes, north of Chicago, desultory stragglers in small flights of a few dozens to some hundreds, all caught were males. From all that I have gleaned from others, I was not aware that females were ever found among those in migration. *C. eubule*, another of our migrants, also seem to be males, as far as I have been able to ascertain.

It is getting on towards the half-century mark since Horn,

Cresson, Skinner, Ridings and I started the NEWS, as its first issue will show; now, in my "eighties," after collecting for seventy years this spring, I find the fire taken from such fathers of science as Leidy, Cope, Le Conte, Packard, Scudder, Strecker, Neumoegen, Holland, Riley, Howard and Edwards, still burning brightly. Dr. Fernald, if he be the one I remember, must also feel waves of the same afflatus.

EUGENE MURRAY-AARON, 3238 N. Oakley Ave., Chicago.

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The **figures within brackets** [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

GENERAL.—Cockerell, T. D. A.—The Entomological Society of London. [76] 1934: 332-342, ill. **Cockerell, T. D. A.**—"Mimicry" among insects. [31] 133: 329-330. **Davis, A. C.**—Notes on the insect inhabitants of wood rat houses in California. [38] 33: 12-24. **Davis, A. C.**—Notes on some insects found in the burrows of the California ground squirrel in Orange County, California. [19] 29: 79-83. **DeLong, D. M.**—What shall be the objective in the training of an entomologist? [12] 27: 53-58. **Engelhardt, G. P.**—Biological explorations in the North and South West. [19] 29: 57-64. **Forbes, W. T. M.**—Namable? [19] 29: 65-67.

Frizzell, D. L.—Terminology of types. [Amer. Midland Nat.] 14: 637-668. **Metcalf & Phillips.** Decrease in government appropriations for entomological work. [68] 79: 253. **Pierce, W. D.**—Some thoughts on the interpretation of experimental data. [12] 27: 185-190. **Ross, E.** — Ueber bedeutende Koleopterologen und den verbleib ihrer sammlungen. [18] 27: 525-529, cont. **Ross, H. H.**—How to collect and preserve insects. [Illinois State Nat. Hist. Surv.] Circ. 25: 27 pp., ill. **Seitz, A.**—Fünf entomologische tage. [17] 51: 49-57, cont. **Steiniger, F.**—Eine besondere form vom bewegungslosigkeit bei insekten. [Nat. und Mus.] 63: 364-370, ill. **Wagner, J.**—Weitere beiträge zur auffassung des sogenannten "Caput fractum" bei insekten. [34] 106: 7-15, ill.

ANATOMY, PHYSIOLOGY, ETC. — **Borror, D. J.** — Ecological studies of Argia moesta (Coenagrionidae) by means of marking. [43] 34: 97-108, ill. **Bugnion, E.**—La Leptura cordigera. Biologie, anatomie, physiologie. [Mem. Soc. Vaudoise Sci. Nat.] 4: 329-364, ill. **Clark, R. L.** — The external morphology of Acroneuria evoluta. (Perlidae, Plecoptera). [43] 34: 121-128, ill. **Galliard, H.**—La mue embryonnaire des hemipteres hematophages. [77] 115: 823-824. **Gresson, R. A. R.**—Studies on the gametogenesis of Stenophylax stellatus, (Trichoptera) Oogenesis. [Pro. R. Soc. Edinburgh] 53: 322-346, ill. **Horn, W.**—Gibt es bei insekten echten dimorphismus der männlichen kopulations-organe? [2] 28: 66-67, ill. **Kerrich, G. J.**—A new case of teratology in Ichneumonidae. [8] 70: 61-62, ill. **Klein, K.**—Ueber die helligkeitsreaktionen einiger Arthropoden. [94] 145: 1-38, ill. **Lutz & Grisewood.**—Reactions of Drosophila to 2537. A radiation. [40] 706: 14 pp., ill. **O'Byrne, H.**—Papilio troilus attacked by Polistes rubiginosus while mating. [19] 29:73. **Pictet, M. A.**—Instincts et réflexes. [Lambillionea] 34: 27-36. **Poos & Wheeler.**—On the hereditary ability of certain insects to transmit diseases and to cause disease-like injuries to plants. [12] 27: 58-69, ill. **Reukauf, E.**—Sind alle echten spinnen giftig? [Mikro. Naturf.] 12: 25-32, ill. **Salt, G.** — Experimental studies in insect parasitism. [Pro. R. Soc. Lond.] B, 114: 450-476, ill. **Savory, T. H.**—Possible factors in the evolu-

tion of Spiders. [75] 13: 392-397. **Semichon, L.**—Sur un nouvel élément contenu dans le corps adipeux des Chenilles. [25] 38: 319-320. **Sherriffs, W. R.**—The internal anatomy of the spider [Hong Kong Nat.] 4: 127-131, ill. **Shibata, K.**—Ecology of subterranean insects. [Trans. Nat. Hist. Soc. Formosa] 23: 335-351. [in Japanese]. **Teissier, G.**—Difference sexuelle dans la resistance a l'inanition des Tenebrio molitor. [77] 115: 791-793. **Wolf & Ras.**—Effect of mitogenetic rays on eggs of Drosophila melanogaster. [31] 133: 499. **Yen-An, F.**—Sur la technique employée a la recherche de la présence de centrosomes chez les Lonicera. [77] 115: 1087-1088.

ARACHNIDA AND MYRIOPODA.—Gertsch, W. J.—Notes on American crab spiders (Thomisidae). [40] 707: 25 pp., ill. (*).

THE SMALLER ORDERS OF INSECTS—Frison, T. H.—Four new species of stoneflies from North America (Plecoptera). [4] 66: 25-30, ill. **Gloyd, L. K.**—A new Corduline dragonfly, Tetragoneuria sepia, from Florida. [Occ. Pap. Mus. Zool. Univ. Michigan] 274: 5 pp., ill. **Hood, J. D.**—Some further new Thysanoptera from Panama. [Pro. Biol. Soc. Washington] 47: 57-81. (*). **Werneck, L.**—Sobre duas especies de Anoplura encontradas em ratos sylvestres do Brasil. [Mem. Inst. Oswaldo Cruz] 27: 407-415, ill. (*). Sobre uma nova especie de Mallophaga encontrada na chinchilla (Trimenoponidae). [Mem. Inst. Oswaldo Cruz] 27: 417-421, ill. (S).

ORTHOPTERA.—Bradshaw, F.—Grasshoppers routed by gulls. [Can. Field-Nat.] 48: 68-69. **Hebard, M.**—Studies in Orthoptera which occur in North America north of Mexican boundary. III Revisionary data and new North American Decticinae. [1] 60: 31-54, ill.

HEMIPTERA.—Bruner, S. C.—Notes on Cuban Dicyphinae. Macrocephalus en Cuba-una correccion. [Mem. Soc. Cubana Hist. Nat.] 8: 35-50. (*). **China, W. E.**—Hemiptera collected by the Oxford University Expedition to West Greenland, 1928. [75] 13: 330-333. **Gould, G. E.**—A change of name in the genus Rhagovelia (Veliidae). [19]. 29: 56. **Hottes, F. C.**—Aphid descriptions and notes.

[Pro. Biol. Soc. Washington] 47: 8 pp. (*). **Lindinger, L.**—Melanaspis eugeniae aus Porto Rico (Coccoidea). [17] 51: 45-46. (*). **de la Torre-Bueno, J. R.**—Note on Heteroptera in wood rat nests. [19] 29: 83. **Yothers, M. A.**—Biology and control of tree hoppers injurious to fruit trees in the Pacific Northwest. [U. S. Dept. Agric.] Tech. Bull. 402: 46 pp. ill.

LEPIDOPTERA.—Cabrera, J.—Algunos insectos raros. [Mem. Soc. Cubana Hist. Nat.] 8: 34. **Comstock & Dammers.**—Additional notes on the early stages of California Lepidoptera. [38] 33: 34, ill. **Duncan, D. K.**—An unusually early hatch [Libythea bachmani]. [19] 29: 56. **Forbes, W. T. M.**—Two wasp-guests from Puerto Rico. [5] 40: 89-92, ill. (*). **Gunder, J. D.**—A check list revision of the genus Basilarchia. [4] 66: 39-48. (*). **Kremky, J.**—Studien an einigen arten der gattung Hemimene (Tortricidae). [Ann. Mus. Zool. Polonici] 10: 61-85, ill. (*) **Meyrick, E.**—A new micro-lepidopteron (Tineina) from Greenland. [9] 67: 59. **Richards, A. G.**—A Correction [to Klots's New Records....]. [19] 29: 64.

DIPTERA.—Bequaert, J.—Notes on the Tabanidae described by the late C. P. Whitney. [Occ. Pap. Boston Soc. Nat. Hist. 8: 81-88. **Brannon, C. H.**—Observations on the blow-fly Lucilia sericata. [Jour. Parasit.] 20: 190-194. **da Costa Lima, A.**—Sobre um novo Aëdes (Ochlerotatus) do Brasil. [Mem. Inst. Oswaldo Cruz] 27: 403-406, ill. (*). **Curran, C. H.**—The Templeton Crocker Expedition of the California Academy of Sciences, 1932. No. 13. Diptera. [61] 21: 147-172, ill. (*). **Edwards, Shannon, Aubertin, Malloch.**—Diptera of Patagonia and South Chile. Part VI. 117-175, ill. (*). Ephydridae, Syrphidae, Conopidae. **Felt, E. P.**—New gall midges. [19] 29: 77-78. **Greene, C. T.**—Tachinid flies with an evanescent fourth vein, including a new genus and five new species. [10] 36: 27-40, ill. **Malloch, J. R.**—Diptera of Patagonia and South Chile. Part VI. 177-391, ill. (*). A remarkable new genus of the family Periscelidae. [107] 3: 52-53, ill. (S*). **Matheson, R.**—Notes on Psorophora (Janthinosoma) horridus. [10] 36: 41-43, ill. **Mullen, J. A.**—Diploneura nitidula. [68] 79: 294. **Tarwid, K.**—

Ueber den systematischen wert von Anopheles maculipennis alexandrae-schingarewae (Culicidae). [Ann. Mus. Zool. Polonici] 10: 57-60, ill.

COLEOPTERA.—Bierig, A.—Un genero y especies nuevas de Xantholini de la america central. Dos nuevos Scopaei neotropicos. New North American Astenus. [Mem. Soc. Cubana Hist. Nat.] 8: 15-23; 24-28; 29-30. (*). **Blake, D. H.**—New West Indian and Central American Chrysomelidae. [19] 29: 45-56, ill. (*). **Brown, W. J.**—The American species of Dalopius (Elateridae). [4] 66: 30-39, ill., cont. (*). **Chagnon, G.**—Contribution a l'études des Coléoptères de la Province de Québec. [Nat. Canadien] 61: 84-95, ill. **Chapin, E. A.**—An apparently new scarab beetle now established at Charleston, South Carolina. [Pro. Biol. Soc. Washington] 47: 33-35. **Duncan, D. K.**—Acmaeodera papagonis. [19] 29: 64. **Hincks, W. D.**—Notes on the Passalidae. [8] 70: 55-59. (S). **Ohaus, F.**—Genera Insectorum. Fasc. 195. Scarabaeidae. Euchirinae-Phaenomerinae. 1-18, ill. **Schedl, K. E.**—Ein neuer Corthylus aus Costa Rica. (Scolytidae). [2] 29: 33-35, ill. **Schedl, K. E.**—Neue borkenkäfer. [2] 30: 37-39. (S). **Trippel, A. W.**—New records of Indiana Chrysomelidae. [19] 29: 74-76. **Uhmann, E.**—Eine neue Cephaloleia-art aus Costa Rica. Beitrag zur kenntnis der Hispinen (Chrys.). [2] 29: 168-169. **Wolfrum, P.**—2 neue Anthribiden aus einer bestimmungssendung des Herrn Nevermann in Costa Rica. [2] 29: 39-41.

HYMENOPTERA.—Dowden, P. B.—Zenillia libatrix, a tachinid parasite of the gypsy moth and the brown-tail moth. [Jour. Agric. Res.] 48: 97-114, ill. **Hicks, C. H.**—The capture and stinging of the prey of Sphex xanthopterus. [38] 33: 39-41. **Rohwer, S. A.**—Descriptions of five parasitic Hymenoptera. [10] 36: 43-48. (*).

SPECIAL NOTICES.—A Catalogue of the works of Linnaeus preserved in the libraries of the British Museum. Edition 2. London. British Museum. 246+63 pp.—**A recently initiated** entomological publication. Year Book, Bureau of Entomology. Chekiang, Hangchow No. 1. 1931. No. 2. 1932. [in Chinese].

JUNGLE BEES AND WASPS OF BARRO COLORADO ISLAND. (With Notes on Other Insects). By PHIL RAU. Published by Phil Rau, Kirkwood, St. Louis County, Missouri. 1933. 324 pp., 100 half-tone plates. $2.75.

The main part of this work is based on observations made during a six weeks' stay on the island, beginning August 16, 1928. There are 26 pages on the Stingless Bees, 54 on the social paper-making Polybia wasps, 21 on the behavior of *Polistes* wasps, 28 covering several genera of social wasps, including the nocturnal *Apoica,* 21 on solitary wasps, and 38 pages of ecological notes on various spiders and other arthropods. Then follow 40 pages on the life and behavior of the Great Carpenter Bee, *Xylocopa.* A multitude of observations are here recorded, dealing with the interesting and often peculiar habits of the tropical bees and wasps, and they offer good reading to any one interested in the Hymenoptera or in social insects generally. Of the Stingless Bees we of the so-called temperate zone have no direct knowledge, but the Polybias with their paper nests remind us of our own yellow-jackets, except for the many surprising variations in habit. The description of the habits of a neotropical *Polistes,* comparing it with a nearly related northern form, offers opportunity for discussing the modes of adaptation to climate. The chapter on the Carpenter Bee, a northern form, takes us again out of the tropics, but is nevertheless very welcome for it represents a more thorough study, made over a series of years, of the life and behavior of this hardy insect whose nests are generally so difficult to investigate.

The book is also a human document, reflecting the personality of its author. We enjoy with him his experience, that of a "dooryard" entomologist, as he calls himself, transported suddenly to the tropical jungle, and we feel how his mind is set atingle by the countless new and strange insects he encounters, and by their still more strange habits. He is impelled to seek explanations and to formulate ideas as to how all these peculiar adaptations have come to be. And so there runs through the book as a thread, the author's continual effort to arrive at an evolutionary explanation of the origin of instincts and of structural adaptations. These ideas finally receive a fuller treatment in the last 40 pages on "Mind as a Forerunner of Evolution." The main thesis is that each instinct must have been acquired intelligently. A new behavior repeated becomes a habit, is transmitted to the offspring and thus becomes an instinct. This is orthodox Lamarckian theory, but is here com-

bined with the mnemic idea. When better fitted strains have been thus evolved, natural selection will then weed out the less fit. Although the reviewer was not converted to the author's views, he has learned to recognize even more clearly that the problem of the evolution of instincts is as difficult a one as that concerning the evolution of the structures of animals or of their physico-chemical adaptations, and that in dealing with psychic characteristics there is added the internal difficulty of interpretation of the observational data. But, however we may feel towards the author's theories, there is no question as to his abilities as an intelligent observer and recorder of insect habits, or of the outstanding value of the present contribution.

R. G. SCHMIEDER.

OBITUARY.

HOWARD AUSTIN SNYDER, an associate of the Entomological Section of the Academy of Natural Sciences of Philadelphia from 1899 to 1918, died at his home at Delanco, New Jersey, on April 3, 1934, at the age of eighty. He was active as a collector of insects in the first decades of the twentieth century. In October, 1905, he visited the Bermuda Islands and exhibited the insects which he collected there at the Section meeting of January 25, 1906 (ENT. NEWS, xvii: 184). This excursion furnished the observations on which he based his article "Color and Environment" (ENT. NEWS, xix: 147-149, 1908), in which he maintained that Bermudan insects are of a lighter color than examples of the same species in the United States, by elimination of the darker individuals more conspicuous on the coral roads and white calcined roofs of those islands. In the exchange column of the NEWS for December, 1909, he had a notice in one of the artificial universal languages, perhaps the only one of this kind in the journal's history. An obituary notice of Mr. Snyder in the Philadelphia *Public Ledger* for April 5, 1934, states that prior to his retirement in 1914, he was with the credit department of Strawbridge & Clothier's large department store in Philadelphia, and gives names of his surviving children.

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